Remarks

Reconsideration and reexamination of the above-identified patent application, as amended, are respectfully requested. Claims 1, 7-8, 12, and 16 are pending in this application upon entry of this Amendment. In this Amendment, the Applicant has amended claims 1, 7-8, 12, and 16; and cancelled claims 2-6, 9-11, 13-15, and 17-20. No claims have been added in this Amendment. Of the pending claims, claim 1 is the only independent claim.

Specification

The Applicant has amended the specification to update the status of the parent application (now U.S. Patent No. 6,732,125).

Double Patenting

The Examiner rejected claims 1-20 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-6 of U.S. Patent No. 6,732,125. The Examiner indicated that a timely filed terminal disclaimer in compliance with 37 C.F.R. § 1.321(c) may be used to overcome an actual rejection based on a nonstatutory double patenting ground provided the conflicting patent is shown to be commonly owned with this application. In response, the Applicant has submitted herewith a terminal disclaimer in compliance with 37 C.F.R. § 1.321(c). Accordingly, the Applicant respectfully requests reconsideration and withdraw of the rejection to the claims under the judicially created doctrine of obviousness-type double patenting.

Claim Rejections - 35 U.S.C. § 103

The Examiner rejected claims 1-20 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,047,294 issued to Deshayes et al. ("Deshayes") in view of U.S. Patent No. 6,490,598 issued to Taylor ("Taylor"). The Applicant believes that the

claimed invention is patentable over any combination of Deshayes and Taylor and has amended independent claim 1 to more clearly define thereover.

1.   The Claimed Invention

The claimed invention, as recited in amended independent claim 1, is a data backup system for use with a server running a storage application that writes and read data blocks.

The data backup system includes a self archiving log structured volume for copying data blocks from a log in primary storage to backing storage while the storage application is running and writing and reading data blocks of an active volume to and from the self archiving log structured volume. The self archiving log structured volume includes the log which has a plurality of log segments and an index. The log segments include a current log segment and active log segments for storing data blocks of the active volume. The log segments further include inactive segments and recycle segments. The index shows the current position of each data block in the log segments.

The self archiving log structured volume satisfies write block requests from the storage application by writing the written data block to the current log segment, converting the current log segment to an active log segment with the current log segment is full, and then updating the index with the current position of that data block in the log. The current log segment and the active log segments of the log make up a working set of segments having a fixed length from which all write request data blocks are satisfied by the self archiving log structured volume.

The self archiving log structured volume satisfies a read block request by looking up the requested data block in the index and then copying the requested data block from the log.

An agent cooperates with the storage application to send a synch event to the self archiving log structured volume when the data blocks of the self archiving log structured volume are in a consistent state with respect to the storage application. The self archiving log structured volume records a synch event by writing a special block to the log containing the date, time, and other information describing the synch event. The self archiving log structured volume constructs a volume index from any synch point by scanning backward in the log and updating the index entry for each data block to the most recent position in the log.

Primary storage and backup storage operable with the self archiving log structured volume to store the logged data blocks and synch events of the self archiving log structured volume. In order to ensure that a volume can be reconstructed from a fixed number of log segments relative to a synch point, the self archiving log structured volume designates the oldest active log segment as an inactive log segment when the working set of segments becomes full, and then compresses and archives this inactive segment to the backing storage, and then discards the contents of this inactive segment from the primary storage, and then designates this inactive segment as a recycle segment.

2.   The Claimed Invention Compared to Deshayes and Taylor

The claimed invention is different than any combination of Deshayes and Taylor in that the claimed invention provides a self archiving log structured volume which includes a log having different types of segments and an index. The self archiving log structured volume is operable to reconstruct a volume from a fixed number of log segments relative to a synch point by writing and moving the data blocks to and from the log segments and using the index in the claimed manner. The Applicant believes that neither Deshayes nor Taylor, alone or in combination, teaches or suggests such features.

In view of the foregoing amendments and remarks, the Applicant believes that amended independent claim 1 overcomes the rejection under 35 U.S.C. § 103(a). Claims 7-8, 12, and 16 depend from amended independent claim 1 and include the limitations thereof. As

a result, the Applicant respectfully requests reconsideration and withdraw of the rejection to claims 1, 7-8, 12, and 16, as amended, under 35 U.S.C. § 103(a).

CONCLUSION

In summary, claims 1, 7-8, 12, and 16, as amended, meet the substantive requirements for patentability. The case is in appropriate condition for allowance. Accordingly, such action is respectfully requested.

If a telephone or video conference would expedite allowance or resolve any further questions, such a conference is invited at the convenience of the Examiner.

Respectfully submitted,

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